

Design and Process Development of Thin-Ply Composites, Phase I

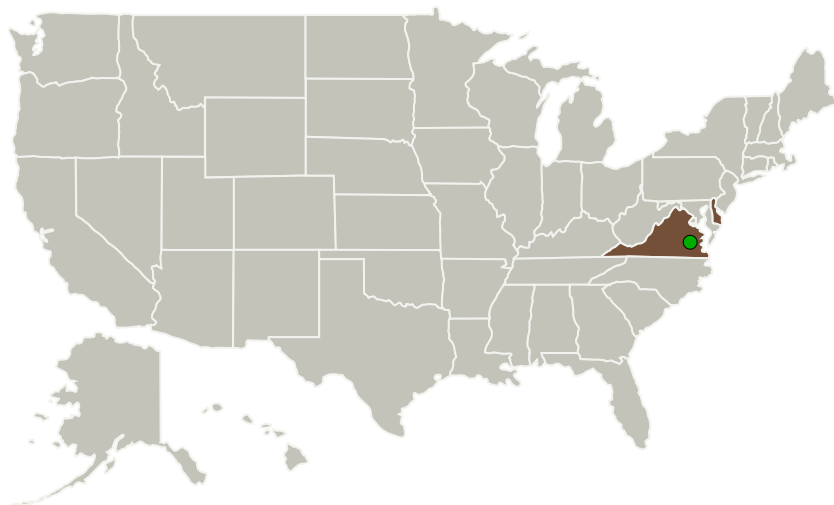
Completed Technology Project (2017 - 2018)



Project Introduction

This project evaluates automated tape placement (ATP) processing of thin ply composites, including process and design modeling, test panel fabrication and mechanical performance evaluation. Key to successful transition of standard ply to thin ply ATP processing is the ability to fabricate uniform high fiber volume and fiber distribution composite parts with below 1% void content. Our ATP robotic system will be adapted to handle thin ply materials, including accurate placement and consolidation to minimize potential defects (adjacent tape gaps creating voids, non-uniform compaction of plies, etc.). Existing modeling of the placement process at our academic partner will support hardware optimization. Coupon fabrication and testing will provide validation of the process to produce high quality parts and initiate the development of a property database (microstructure, mechanical performance, etc.).

Primary U.S. Work Locations and Key Partners



Design and Process Development of Thin-Ply Composites, Phase I Briefing Chart Image

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Organizations Performing Work	Role	Type	Location
Composites Automation, LLC	Lead Organization	Industry	Newark, Delaware
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia
University of Delaware	Supporting Organization	Academia	Newark, Delaware

Primary U.S. Work Locations

Delaware	Virginia
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Project Transitions

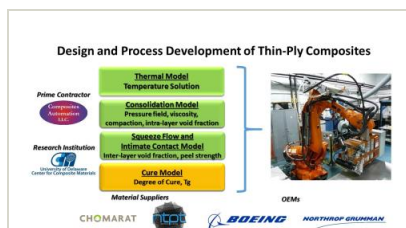
▶ **June 2017:** Project Start

✓ **June 2018:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140844>)

Images



Briefing Chart Image

Design and Process Development of Thin-Ply Composites, Phase I
Briefing Chart Image
(<https://techport.nasa.gov/image/132029>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Composites Automation, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

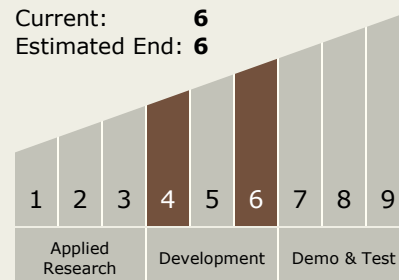
Carlos Torrez

Principal Investigator:

Roger Crane

Technology Maturity (TRL)

Start: 4
Current: 6
Estimated End: 6



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.4 Manufacturing
 - └ TX12.4.1 Manufacturing Processes

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System